GEAR SHIFTING
WITHOUT LEVERS

ON THE

McFARLAN SIX

The McFarlan-Gray System

SINCE the first automobile was marketed there has been constant effort to eliminate the harder work connected with the driving of a car. In order of difficulty, starting the motor and shifting gears are easily first and second and naturally these two operations have been the first ones to be done away with. The starting crank has been obsolete for some time and the car on which one is required is an exception rather than the rule. It remains for the McFarlan Six to pioneer the field of Mechanical Gear Shifting as it pioneered the field of medium priced six cylinder cars and in the adoption of the Gray Pneumatic Gear Shift as equipment for McFarlan cars, this company has taken the longest step forward that has yet been taken in the automobile field.

The Gray Pneumatic Gear Shift was adopted for McFarlan cars after the most rigourous tests and in all of them it did its work and added to the ease of operation of the car to such an extent that it turned the most skeptical of our engineers into enthusiastic supporters. And for real dyed in the woll skepticism get an automobile engineer.

The McFarlan preference for pneumatic machinery has been explained in every catalogue and pamphlet ever issued by this company, but a resume the reasons for that preference will not be amiss here.

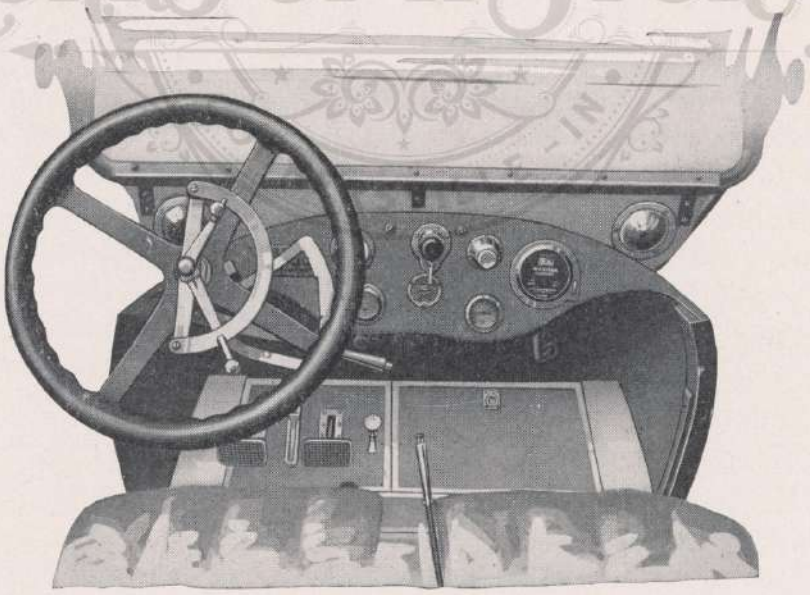
When you board a train or street car you are entrusting your life to a mechanism controlled by compressed air; the air brake. When an enormous Diesel engine is started it is started by compressed air. Most of the high speed elevators are controlled by some fluid under pressure. Your car rolls on compressed air.

In every one of these cases the work to be done is of the hardest kind, and compressed fluid machinery does it easily and surely without the wear and tear that is noticeable where other types of machinery are employed. The pneumatic machinery is chosen for this heavy work because it is best for it, and not because the exigencies of a sales campaign demand it. You never think of doubting the air brake, the elevator, or the Diesel engine starter. And users of McFarlan cars never think of doubting the McFarlan Pneumatic engine starter. They all do their work quickly and surely with the minimum of fuss and wear.

The Gray Pneumatic Gear Shift is constructed upon the principal of the air brake. A movement of a small lever and compressed air does the work, and the work that it does has been, heretofore, the hardest that the motorist has had to do since self starters came into vogue.

All pneumatic machinery is simple, too. None of the machines mentioned are at all complicated and ordinary, widely understood laws of mechanics govern their action. It is so with the Gray Gear Shift. There is a double acting piston in a cylinder. On the rod leading from this piston is a latch that engages pull rods to the various gears. It is a simpler mechanism than the transmission itself, which every driver understands. Any one of a mechanical turn of mind will understand the operation of the shift after once seeing it in operation, and a novice can drive a car equipped with it after one lesson.

WORKS OF HISTORICA



Forward compartment. Gear selector just under steering wheel. Hand Gear lever removed.

Driver's Eyes Always on the Road.

THE drivers eyes are always on the road. There is no bending over to pull at the gear lever at a treacherous turn on a hill or in close traffic. Consider that.

There is a quadrant just below the steering wheel, clamped to the steering mast. This quadrant is shown in the picture of the front compartment of a McFarlan car on page 3. To start the car set the lever that works on this quadrant at 1. Press down on the clutch pedal. The clutch pedal operates a valve in the shifting mechanism and the shift is made. Releasing the clutch then starts the car.

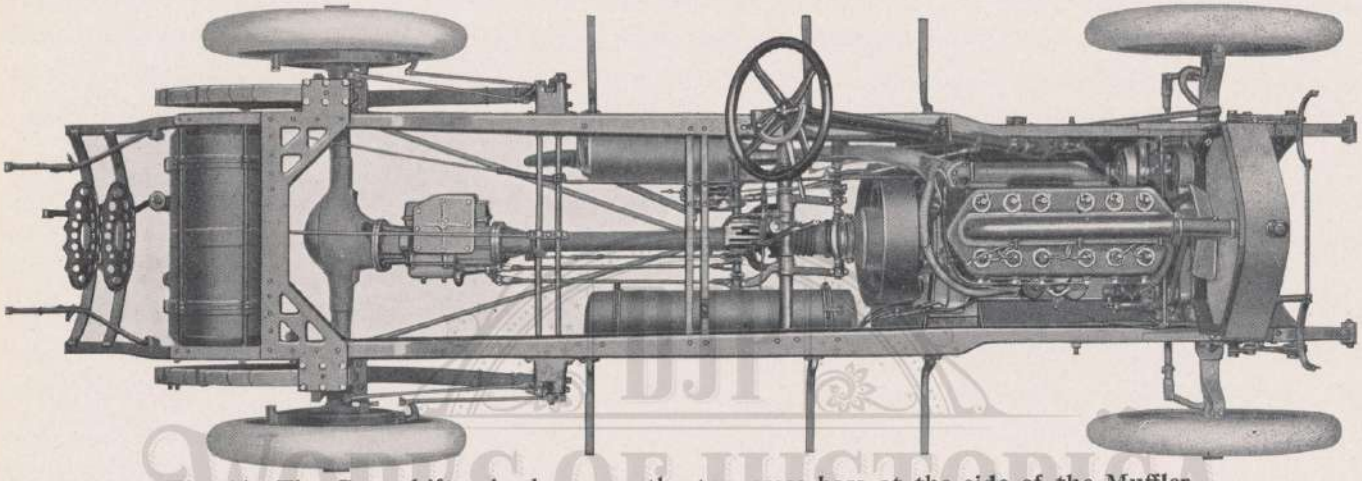
Now set the lever at 2 and press down the clutch pedal again. The valve is operated twice by each pressure of the clutch pedal you will notice. The first operation forces all gears to neutral and the second engages the intermediate speed. Repeat the operation for "high." You are "locked out" of reverse on the quadrant the same as you are with a hand lever. A little latch has to be depressed to get into that speed.

In the entire operation, you will note, the driver has not bent over and the only exertion for him has been pressing down on the clutch pedal, and the action of the McFarlan clutch is compounded so a pressure of seven pounds serves to throw out the clutch. Surely we are not overstating the case when we say that the frailest woman can drive a big McFarlan Six with perfect safety.

You will also note that there has been no worry about "neutral". The shifting mechanism is such that all gears must be in neutral position before a shift can be made. To get into neutral to stop the car, the clutch pedal is pressed only half way down, opening the valve in the shift only once, as explained above, and this forces all gears to neutral.

Last, but by no means least, there are no stripped gears. The shifting action simply cannot take place until the clutch pedal is clear "OUT", and with the clutch clear out there can be no stripped gears.

"Now," you say, "that is all very nice and pretty, but,"(You just can't help being somewhat "triumphant" at this point, can you?) what if one should stall the motor on a hill and the car should back down against the gear, which even the most expert driver might do. You know this will effectually lock a gear. But don't worry if this should happen to you in a McFarlan car with a Gray Pneumatic Gear Shift. Simply press the clutch pedal half way down and the gears will come into neutral all right, and right away.



(Fig. 1.) The Gear shifter is shown on the two cross bars at the side of the Muffler.

The shifting mechanism will MOVE THE CAR far enough to unlock the gear if it won't come out otherwise.

The effective pressure in the pressure tank is TREBLED in the shifting mechanism. Thus, if you have two hundred pounds pressure in the tank you get the effect of six hundred pounds in the gear shift, because of the leverage introduced by the small pinion that actuates the gear pulls.

Thus, the McFarlan Pneumatic System is complete, starting, gear shifting, car and cushion cleaning, and tire pumping are all accomplished without labor and by SIMPLE, EASILY UNDERSTOOD machinery that every regularly equipped mechanic understands. The compressed air is furnished by an ALL METAL pump which is mounted on the motor. Pressure on a small button throws this pump into gear when pressure is needed and a touch on a small latch releases it when enough pressure is obtained. The pump does not operate continually. Fifteen to Twenty minutes per day, all told, will suffice to keep pressure enough for ordinary driving.

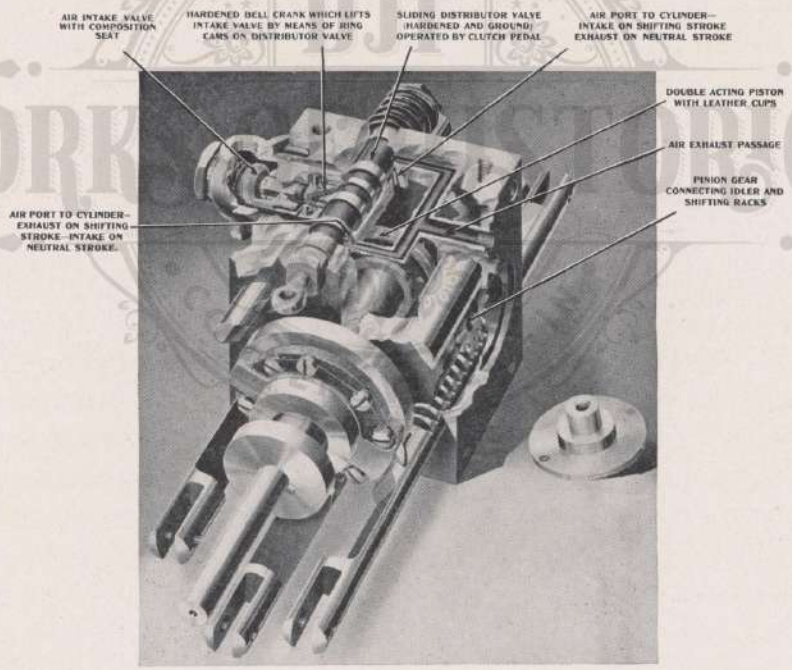
This little air pump is oiled automatically from the oiling system of the motor, and thus the last bit of trouble for the motorist is removed. Truly he has an AUTOMATIC system of car control.

The hand lever for operating the gears is removed and is carried in the tool box. If, by accident or for any other reason the gear shifting mechanism should get out of order, the

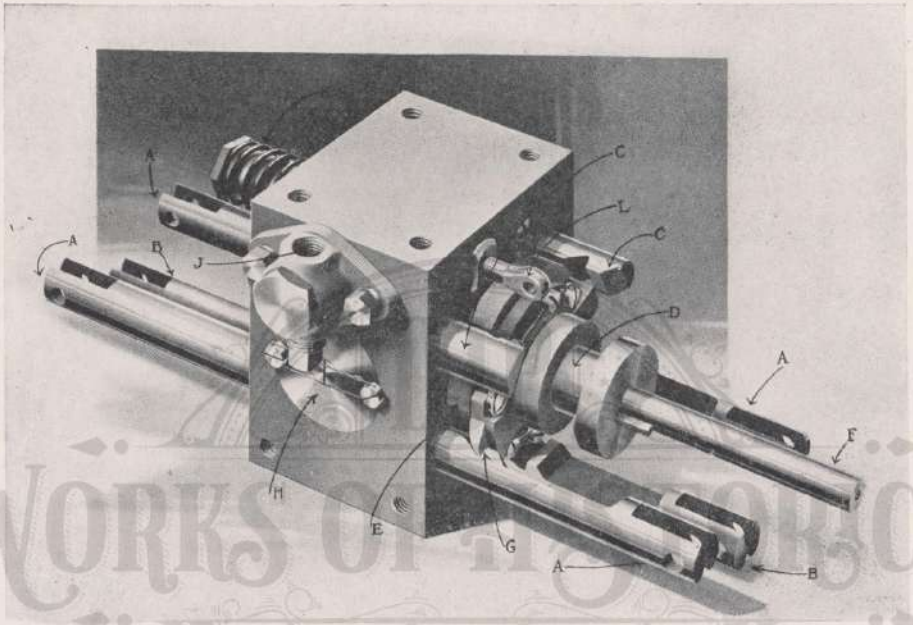
gear lever may be inserted by simply setting it in place and the regular hand shift is then available. When the competitor says "AH, yes" in a superior tone of voice step to the tool box in his car and show him his starting crank.

ANTICIPATE YOUR GEAR.

Any gear may be anticipated. If, when starting up a hill, you fear you will not be able to make it on direct simply set the selector lever at second or low, then when the necessity for shifting arrives simply press down on the clutch pedal and the shift will be made, and made in a twinkling, much quicker than you could do it by hand.


AIR INTAKE VALVE WITH COMPOSITION SEAT
HARDENED BELL CRANK WHICH LIFTS INTAKE VALVE BY MEANS OF RING CAMS ON DISTRIBUTOR VALVE
SLIDING DISTRIBUTOR VALVE (HARDENED AND GROUND) OPERATED BY CLUTCH PEDAL
AIR PORT TO CYLINDER—INTAKE ON SHIFTING STROKE EXHAUST ON NEUTRAL STROKE
DOUBLE ACTING PISTON WITH LEATHER CUPS
AIR EXHAUST PASSAGE
PINION GEAR CONNECTING IDLER AND SHIFTING RACKS
AIR PORT TO CYLINDER—EXHAUST ON SHIFTING STROKE—INTAKE ON NEUTRAL STROKE.

(Fig. 2.) This cut away view shows the working parts of the Gray Pneumatic Gear Shift in exact relation to each other just after a shift has been made and the clutch engaged. The sliding distributer valve is being pulled forward by a half depression of the clutch pedal—the ring cam has lifted the main intake valve by means of the hardened bell crank which will admit air into the forward end of the cylinder and the backward stroke of the piston will bring all gears to the neutral position.



(Fig. 3.) A. A. Two main shifting racks which are attached to the gear shifting rods of the transmission. These racks are forced forward by means of the selector latch G operated by a double acting piston working in a cylinder bored out of the center of the main casting and make the two forward shifts on the ordinary three speed forward and reverse transmission. The two backward shifts are made by engaging the slector latch with the idler shifting racks C. C. which when forced forward by the admission of air into the cylinder, drive the main shifting racks backward by means of a pinion gear protected and enclosed by the cover plate H. The selector shaft F is connected to the selector quadrant on the steering post. The desired gear is selected by turning the selector shaft so that the latch G engages the rack operating the particular gear selected. Air is admitted at the intake J and enters the cylinder through a valve operated by cams on the distributing valve K. This sliding valve is drawn forward by depressing the clutch pedal to which it is attached by a cable or rod at L. A half depression of the clutch pedal admits air to the selector end of the cylinder at the instant the clutch is fully disengaged and forces all gears to neutral by means of the selector disc. E. Both shifter racks and idler racks are made with a shoulder which is engaged by the selector disc on the return movement of the piston and thus all gears are disengaged. The selector disc E is attached to the outer shouldered end of the piston rod by means of a threaded locking collar so that it can be rotated freely by the selector shaft F to which it is keyed and on which it slides with the movement of the piston. The full depression of the clutch pedal exhausts the air and at the same time admits air into the other end of the cylinder, forcing forward the selector mechanism, with the particular shifting or idler rack engaged by the selector latch. The illustration shows the position of the racks when all gears are in neutral with the selector latch G engaged in one of the shifting racks ready for a shift. B is a fifth shifting rack for four speed forward transmissions, and is not used in the shifter when applied to McFarlan Cars.

The Practical Side.

FOR the practical side of the gear shift refer to figures 1, 2, and 3. In figure 1 you see the gear shift installed on the McFarlan chassis. It is the small box that may be seen just back of the middle frame cross member and connected to the clutch pedal by a small rod. Figure 3 shows the outside of the shifting mechanism and figure 2 shows a cut out view of it that will explain its action at a glance. In figure 3 note that the spool D and latch G SLIDE on the shaft F. This shaft does not move backward and forward. You will note, also, that the pulls A and C must both operate when one of them does, one backward and one forward, so when the latch G is engaged in C it will pull A backward while pulling C forward.

In the case of the McFarlan car the reverse gear is in engagement when the pull C on the side farthest from you is pulled forward, and low is in engagement when A on the same side is pulled forward. C and A on the other side of the box are second and high, respectively. The lever B is not used on McFarlan cars, as the McFarlan carries only a three speed transmission and the lever B is for a fourth speed in case there is one.

When the selector on the steering mast is moved the shaft F is rotated, and with it goes the Selector Disc E and the latch G.

When the clutch pedal is pressed it pulls forward the sliding distributer valve, and the ring cams on this valve actuate the air Valve. The two inner rings on the valve are the ring cams. The other two rings on the valve close the front and rear air ports at the proper time to admit air to the back or front side of the piston.

The connection between the clutch pedal and the valve in the shifter is adjustable and any lost motion may be taken up in a moment's time with only a small wrench.

McFARLAN MOTOR COMPANY

CONNERSVILLE, IND.

EACEC BOR FOS 0001